

EVAN MARC LAZEROWITZ, Esq.  
COOLEY, LLP  
55 HUDSON YARDS  
NEW YORK, NY, 10001-2163  
212-479-6000  
ELAZEROWITZ@COOLEY.COM  
CALENDARDEPARTMENT@COOLEY.COM  
Attorney Bar ID: 063232013

SUPREME COURT OF NEW JERSEY

APP. DIV. # **A-001358-22**

SUPREME COURT # **089524**

State of New Jersey,

Plaintiff,

v.

Sean Jones,

Defendant.

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State of New Jersey,

Plaintiff,

v.

Richard Roche,

Defendant.

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State of New Jersey,

Plaintiff-Respondent,

v.

Timothy Harris,

Defendant-Petitioner.

NOTICE OF MOTION  
MOTION FOR LEAVE TO APPEAR AMICUS  
CURIAE

**PURSUANT TO N.J. CT. R. 1:13-9, NEUROSCIENCE, PSYCHOLOGY, AND JUVENILE JUSTICE SCHOLARS ("AMICI") RESPECTFULLY REQUEST THIS COURT'S PERMISSION**

TO APPEAR AS AMICI CURIAE, FILE A BRIEF, AND PARTICIPATE IN ORAL ARGUMENT  
IN SUPPORT OF THE THREE ABOVE CAPTIONED PETITIONS FOR CERTIFICATION.

FOR THE FOREGOING REASONS, AMICI RESPECTFULLY REQUEST THAT THE COURT  
GRANT THEIR APPLICATION. THE PROPOSED BRIEF IS ATTACHED.

Attorney for NEUROSCIENCE,  
PSYCHOLOGY, AND JUVENILE JUSTICE  
SCH

Dated: 07/12/2024

S/ EVAN MARC LAZEROWITZ

**SUPREME COURT OF NEW JERSEY**  
Docket No. 089524

STATE OF NEW JERSEY,  
*Plaintiff-Respondent,*

v.

SEAN JONES,  
*Defendant-Petitioner.*

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STATE OF NEW JERSEY,  
*Plaintiff-Respondent,*

v.

RICHARD ROCHE,  
*Defendant-Petitioner.*

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STATE OF NEW JERSEY,  
*Plaintiff-Respondent,*

v.

TIMOTHY HARRIS,  
*Defendant-Petitioner.*

CRIMINAL ACTION

On appeal from Superior Court of New Jersey, Appellate Division, Docket Nos. A-3911-21; A-1264-22; A-1358-22.

Sat Below: Hon. Thomas W. Sumners, Jr., P.J.A.D.; Hon. Lisa Rose, J.A.D.; Hon. Ellen Torregrossa-O'Connor, J.A.D.

**Motion of Neuroscience, Psychology, and Juvenile Justice Scholars for Leave to Appear as Amici Curiae, File Brief, And Participate in Oral Argument; [Proposed] Brief of Amici Curiae**

Adam S. Gershenson\*  
Matthew Oliver\*  
COOLEY LLP  
500 Boylston St.  
Boston, MA 02116

Matt K. Nguyen\*  
COOLEY LLP  
1299 Penn. Ave. NW, Suite 700  
Washington, DC 20004

Evan Lazerowitz (#063232013)  
COOLEY LLP  
55 Hudson Yards  
New York, NY 10001  
elazerowitz@cooley.com

*Counsel for Amici Curiae*  
*\*Pro Hac Vice pending*

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**MOTION OF NEUROSCIENCE, PSYCHOLOGY, AND JUVENILE  
JUSTICE SCHOLARS FOR LEAVE TO APPEAR AS AMICI CURIAE,  
FILE BRIEF, AND PARTICIPATE IN ORAL ARGUMENT**

Pursuant to N.J. Ct. R. 1:13-9, neuroscience, psychology, and juvenile justice scholars (“amici”) respectfully request this Court’s permission to appear as amici curiae, file a brief, and participate in oral argument in support of the three above-captioned petitions for certification. The U.S. Supreme Court, this Court, and other state high courts routinely draw upon scientific literature in these fields to scrutinize the constitutionality of imposing extended sentences, including functional life without parole (“LWOP”), on adolescents.

As more than thirty of the nation’s leading scholars in neuroscience, psychology, and juvenile justice, amici respectfully submit this Brief to highlight powerful scientific evidence regarding continued brain and behavioral development of persons aged 18-20, known as late adolescents.<sup>1</sup> Novel methods of brain and behavioral assessment and surging scholarly attention to late adolescent development have prompted tremendous advances in neuroscience and psychology. This robust body of empirical evidence conclusively establishes that behavior, personality, and the brain itself continue to change markedly throughout late

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<sup>1</sup> Counsel for amici authored the proposed Brief in full. No person or entity, including counsel or amici, made a monetary contribution intended to fund the preparation or submission of the Brief. The identities, titles, and affiliations of scholar amici are detailed in the Appendix.

adolescence. Due to these changes, late adolescents are more likely (even more than adolescents under 18 and neurological adults) to engage in irrational, risky, and impulsive behavior by virtue of their developing brains and vulnerability to external influences, like peer pressure. But as their brains develop and capacity for reasoned decision-making improves, late adolescents grow beyond these behaviors. These findings have major implications for late adolescent sentencing and rehabilitation.

Amici have a “special interest, involvement or expertise” in ensuring courts have access to this science in evaluating the constitutionality of sentences imposed on late adolescents. N.J. Ct. R. 1:13-9(a). In recent years, amici have provided this expertise to other state high courts as they decide similar questions. *See, e.g., People v. Parks*, 987 N.W.2d 161 (Mich. 2022); *People v. Poole* 977 N.W.2d 530 (Mich. 2022); *People v. Mattis*, 224 N.E.3d 410 (Mass. 2024); *People v. Robinson*, 224 N.E.3d 391 (Mass. 2024); *People v. Hardin*, 543 P.3d 960 (Cal. 2024). Amici have the same special interest here as this Court considers extending *State v. Comer*, 249 N.J. 359 (2022), whose reasoning centered on the incomplete development of adolescents under 18, to late adolescents undergoing similarly profound maturation.

For the foregoing reasons, amici respectfully request that the Court grant their application. The proposed brief is attached.

By: /s/ Evan Lazerowitz  
Evan Lazerowitz

*Counsel for Amici Curiae*

**[PROPOSED] BRIEF OF AMICI CURIAE NEUROSCIENCE,  
PSYCHOLOGY, AND JUVENILE JUSTICE SCHOLARS**

**QUESTION PRESENTED**

Should *State v. Comer*, 249 N.J. 359 (2022)—which held that Article I, Paragraph 12 compels resentencing hearings following 20 years of incarceration for adolescents under 18 at the time of their offense given their incomplete brain and behavioral development—apply to late adolescents aged 18-20 undergoing similarly profound development?

**LEGAL ARGUMENT**

**I. AN ADOLESCENT’S INCOMPLETE BRAIN AND BEHAVIORAL DEVELOPMENT INFORMS WHETHER A FUNCTIONAL LWOP SENTENCE VIOLATES ARTICLE I, PARAGRAPH 12.**

The U.S. Supreme Court and this Court have repeatedly recognized that adolescents under 18 are protected by their respective Constitutions from overly punitive sentencing, including LWOP, because they are particularly susceptible to impulsivity and social influences, and have remarkable potential for rehabilitation. *See, e.g., Miller v. Alabama*, 567 U.S. 460, 478 (2012); *Graham v. Florida*, 560 U.S. 48, 62–82 (2010); *Roper v. Simmons*, 543 U.S. 551, 564–73, 578 (2005); *Comer*, 249 N.J. at 384–88, 394–403; *State v. Zuber*, 227 N.J. 422, 451-53 (2017). In reaching these holdings, both courts relied extensively on, among other things, the scientific literature (since affirmed and supplemented) on adolescent immaturity and incomplete cognitive development. *See, e.g., Miller*, 567 U.S. at 472 & n.5; *Comer*,

249 N.J. at 384–85; *Zuber*, 227 N.J. at 441–42.

The *Miller* Court, in particular, detailed the mitigating attributes of adolescence, borne out of neuroscience and social science, that compel these constitutional guardrails. **First**, adolescents exhibit a “ ‘lack of maturity and an underdeveloped sense of responsibility,’ ” leading to recklessness, impulsivity, and heedless risk-taking.” *Miller*, 567 U.S. at 471 (quoting *Roper*, 543 U.S. at 569). **Second**, adolescents “ ‘are more vulnerable . . . to negative influences and outside pressures,’ including from their family and peers; they have limited ‘contro[l] over their own environment’ and lack the ability to extricate themselves from horrific, crime-producing settings. ” *Id.* (quoting *Roper*, 543 U.S. at 570). **Third**, during adolescence, personality “is not as ‘well formed’ as an adult’s; his traits are ‘less fixed’ and his actions less likely to be ‘evidence of irretrievabl[e] deprav[ity].’ ” *Id.*

In *Zuber*, this Court reinforced these mitigating attributes of adolescence in the context of the N.J. Constitution, explaining that, during sentencing, “court[s] should consider factors such as defendant’s ‘immaturity, impetuosity, and failure to appreciate risks and consequences’; ‘family and home environment’; family and peer pressures; ‘inability to deal with police officers or prosecutors’ or his own attorney; and ‘the possibility of rehabilitation.’ ” 227 N.J. at 453. In doing so, *Zuber* stressed “*Miller*’s command that a sentencing judge ‘take into account how [adolescents] are different, and how those differences counsel against irrevocably

sentencing them to a lifetime in prison,’ applies with equal strength to a sentence that is the practical equivalent of life without parole.” *Id.* at 446–47 (quoting *Miller*, 567 U.S. at 480). This protection, according to the Court, emerges from the scientific reality that, “for experts, it is difficult at an early age to differentiate between the immature offender who may reform and the [adolescent] who is irreparably corrupt” and “[i]t is even harder for a judge to make that determination at the moment the [adolescent] offender appears for sentencing.” Drawing on *Zuber*’s powerful reasoning, this Court in *Comer*, once again expounding on *Miller*’s mitigating attributes of adolescence undergirded by brain and behavioral science, set forth a bright-line rule that the N.J. Constitution guarantees adolescents under 18 at the time of their offense sentenced to the “functional equivalent of life without parole” the right to resentencing hearings after twenty years imprisonment. *Comer*, 249 N.J. at 381, 401–02 (citing N.J. Const. art. 1, ¶ 12).

As the following Section demonstrates, the scientific consensus today is that *Miller*’s mitigating attributes of adolescence, which this Court found decisive in *Zuber* and *Comer* for persons under age 18, apply with compelling force to late adolescents ages 18-20. *Comer*, 249 N.J. at 397.<sup>2</sup> Just as this Court emphasized that

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<sup>2</sup> Consistent with that scientific consensus, amici agree wholeheartedly with the scientific evidence and arguments laid out in the amicus brief filed by several organizations also in support of the petitions. *See* Brief of Amici Curiae American Academy of Pediatric Neuropsychology, the American Civil Liberties Union of New Jersey; the Center for Juvenile Justice Reform at Georgetown University; the

adolescents under 18 “lack maturity and responsibility” and “are more vulnerable to negative influences and outside pressures because their character is not well formed” due to incomplete brain and behavioral development, *see id.* at 394, 400 (cleaned up), the same is true for late adolescents. From a scientific perspective, a person’s 18th birthday is not a rational dividing line, because the same science of diminished culpability and enhanced capacity for rehabilitation persist throughout late adolescence.<sup>3</sup> Brain science leaves no doubt that late adolescents too remain uniquely vulnerable to these mitigating attributes of adolescence. Accordingly, applying the reasoning *Zuber* and *Comer* to late adolescents leads to the inescapable conclusion that the N.J. Constitution’s categorical prohibition on functional LWOP sentences for adolescents under 18 must apply to late adolescents as well.

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Center for Law, Brain and Behavior of the Massachusetts General Hospital at Harvard Medical School; the Gault Center; the Juvenile Law Center; the Pacific Juvenile Defender Center; and The Sentencing Project.

<sup>3</sup> In fact, in recent years, several state high courts—e.g., Michigan, Massachusetts, and Washington—have reinforced stronger constitutional protections for late adolescents precisely because, much like adolescents under 18 and in contrast “to older adults, [late adolescents] are more impulsive, more concerned with their immediate circumstances, and less able to envision future consequences”; and so “risky behaviors tend to peak in late adolescence,” “due to differences in brain structure.” *People v. Mattis*, 224 N.E.3d 410, 421, 423 (Mass. 2024); *People v. Parks*, 987 N.W.2d 161 (Mich. 2022); *In Matter of the Personal Restraint of Monschke*, 482 P.3d 276 (Wash. 2021). Those courts also concluded that, just like adolescents under 18, late adolescents also “have greater capacity to change . . . [given] the plasticity of the brain during these years.” *Mattis*, 224 N.E. at 423.

## **II. THE SCIENTIFIC CONSENSUS REVEALS PROFOUND BRAIN AND BEHAVIORAL DEVELOPMENT BEYOND 17 YEARS OF AGE AND THROUGHOUT LATE ADOLESCENCE**

The contemporary scientific community recognizes late adolescence—*i.e.*, the period of growth widely accepted to capture ages 18, 19, and 20—as a key stage of ongoing adolescent development characterized by profound brain, behavioral, and psychological change. This consensus arises out of myriad peer-reviewed studies centering on late adolescents over the past two decades. Late adolescent brain and behavioral development does not merely entail minor changes in brain structure and function, but rather “a series of developmental cascades” and transformations across multiple brain networks that, in turn, enable those at the tail-end of late adolescence to achieve better control of behavioral impulses by neurological adulthood.<sup>4</sup>

### **A. Fundamental Changes in Brain Development Occur Through Late Adolescence.**

1. *Brain imaging shows late adolescent brains, especially under emotional arousal, resemble brains earlier in adolescence.*

The brain shows dynamic changes in structure, function, and connectivity throughout late adolescence. Using modern tools like functional magnetic resonance imaging (“fMRI”), amici and others scholars have observed that, during adolescence

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<sup>4</sup> Arnett, *Emerging Adulthood: A Theory of Development from the Late Teens through the Twenties*, *Am. Psych.* 469-79 (2000); Jaworska, *Adolescence as a Unique Developmental Period*, *J. Psychiatry Neurosci.* 291–92 (2015); Masten & Cicchetti, *Developmental Cascades*, *22 Dev. Psychopathology* 491–95 (2010); Casey et al., *Development of the Emotional Brain*, *693 Neurosci. Letters* 29–34 (2019).

including late adolescence, the brain shifts from prioritizing local connections to exhibiting robust distal connections vital to complex reasoning and decision-making.<sup>5</sup> Both functional connectivity and task-based prefrontal activity appear less mature under emotional arousal (e.g., threat anticipation) relative to non-arousing conditions. In these scenarios, adolescents under 18 and late adolescents show impulsivity and risk preferences (a) similar to one another and (b) unlike young adults, suggesting that susceptibility to situational diminished capacity persists through late adolescence.<sup>6</sup>

Although it is easy to distinguish between brain images of young adolescents compared to neurological adults, it is exceedingly difficult to differentiate the brain images of adolescents under 18 and adolescents aged 18-20.<sup>7</sup> This is due to strong similarities in brain immaturity as well as incomplete functional connectivity between their brain systems during this sustained developmental period.<sup>8</sup> Not only do late adolescents exhibit the highest risk preferences among all age groups, but their brain images also reveal indistinguishable levels of underdeveloped functional

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<sup>5</sup> Dosenbach et al., *Prediction of Individual Brain Maturity using fMRI*, 329 *Sci.* 1358–61 (2010).

<sup>6</sup> Rudolph et al., *At Risk of Being Risky*, 24 *Dev. Cognitive Neurosci.* 93–106 (2017); Cohen et al., *When is an Adolescent an Adult? Assessing Cognitive Control in Emotional and Nonemotional Contexts*, 27 *Psych. Sci.* 549–62 (2016); Kinscherff et al., *White Paper on the Science of Late Adolescence A Guide for Judges, Attorneys, and Policy Makers*, MGH Center for Law, Brain & Behav., at 2 (2022).

<sup>7</sup> Cohen, *supra* note 6.

<sup>8</sup> *Id.*; Dosenbach, *supra* note 5.

connections, especially under emotional arousal (including stressful states in which serious crimes such as homicide may occur).<sup>9</sup>

These findings suggest that the late-adolescent brain in emotionally-charged situations generally manifests as less mature than in calm, controlled environments, and that this immaturity is linked to irrationality and risk-taking.<sup>10</sup> Together, the neuroscientific evidence demonstrates that brain function and cognitive capacity vary based on emotional and social contexts, such that neurological adult capacity in these contexts is not generally observed until after late adolescence—even though late adolescents may appear, from external appearances, to be fully mature.

Indeed, recent studies confirm that late adolescence involves substantial ongoing maturation in the brain regions and circuitry that process information related to rewards and emotional reactivity, such as the prefrontal cortex important for rational decision-making and impulse control.<sup>11</sup> As the brain matures during late adolescence into neurological adulthood, subcortical and cortical pathway changes are associated with improved cognitive capacity in social and emotional contexts. During this period, a substantial reduction occurs in a late adolescent's propensity

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<sup>9</sup> Rudolph, *supra* note 6; Cohen, *supra* note 6.

<sup>10</sup> Rudolph, *supra* note 6.

<sup>11</sup> Somerville, *Searching for Signatures of Brain Maturity*, 92 *Neuron*. 1166–67 (2016); *see* Cohen, *supra* note 5; Braams et al., *Longitudinal Changes in Adolescent Risk-Taking, Pubertal Development, and Risk-Taking Behavior*, 35 *J. Neurosci.* 7226 (2015); Insel et al., *Development of Corticostriatal Connectivity Constrains Goal-Directed Behavior During Adolescence*, 8 *Nature Commc'n*. 1605 (2017).

to engage in reckless acts.<sup>12</sup> So while these transformations leave late adolescents particularly vulnerable to certain forms of transient mistakes, those processes do not freeze them in late adolescence in perpetuity. To the contrary, their brains develop into early adulthood, at which point they are more in control and much less likely to engage in criminality.<sup>13</sup>

2. *Late adolescents undergo dynamic brain development rendering them uniquely vulnerable to risk-taking behavior.*

“[H]allmark characteristics of young adults [include] rash behavior and an inability to appreciate risks and consequences.” *Comer*, 249 N.J. at 398. Brain development is a dynamic and hierarchical process that occurs throughout life, especially during the extended period of adolescence. Recent scientific findings indicate that, due to the timing of certain brain development processes, late adolescents are especially susceptible to engaging in risky and impulsive behavior, and that their proclivity for such behavior generally recedes upon reaching neurocognitive adulthood.

Brain systems and the connections between them undergo refinement with age and experience. The timing of these changes, however, varies for different brain regions and networks. Subcortical regions including the ventral striatum and

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<sup>12</sup> See Cohen, *supra* note 6; Rudolph, *supra* note 6.

<sup>13</sup> Hawes et al., *The Developmental Course of Psychopathic Features*, 77 *J. Rsch. in Personality* 83–89 (2018).

amygdala, which are important in reward and emotional learning and processing, exhibit earlier structural and functional development than cortical regions.<sup>14</sup> By contrast, the prefrontal cortex, which modulates self-control and complex decision-making, continues to mature throughout late adolescence. This extended window of prefrontal maturation parallels the prolonged social, emotional, and cognitive development that marks late adolescence.<sup>15</sup> Because the prefrontal cortex is more developed during late adolescence than earlier stages of adolescence, late adolescents have marginally better cognitive control and decision-making skills than they did when they were younger. However, because the brain's motivational and emotional systems are comparatively more developed and hyper-responsive through late adolescence, late adolescents remain more vulnerable than adolescents under 18 and neurological adults to lapses in self-control or impulsive decision-making—especially when in emotionally-heated situations,<sup>16</sup> even if they otherwise show mature cognitive appraisal of emotional inputs.<sup>17</sup>

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<sup>14</sup> Mills et al., *The Developmental Mismatch in Structural Brain Maturation during Adolescence*, 36 *Dev. Neurosci.* 147–60 (2014); Braams, *supra* note 11.

<sup>15</sup> Steinberg & Icenogle, *Using Developmental Science to Distinguish Adolescents and Adults Under the Law*, 1 *Ann. Rev. Dev. Psych.* 21-40 (2019).

<sup>16</sup> Cohen, *supra* note 6.

<sup>17</sup> Silvers et al., *VIPFC-vmPFC-amygdala Interactions Underlie Age Related Differences in Cognitive Regulation of Emotion*, 27 *Cerebral Cortex* 3502–14 (2017).

By the end of late adolescence, the brain's development exhibits a crucial shift. Where the younger brain predominantly relies on emotional, or limbic circuitry, this period facilitates the transition to a neurocognitively adult brain that relies more on the cognitive control, or prefrontal circuitry.<sup>18</sup> While both brain systems play important roles in decision-making, the limbic circuitry dominant in adolescence, including late adolescence, governs short-term reward/pleasure (through the ventral striatum and orbitofrontal cortex)<sup>19</sup> and emotional arousal (through the amygdala, hippocampus, and ventromedial prefrontal cortex).<sup>20</sup> By contrast, the prefrontal circuitry (lateral prefrontal cortex and posterior parietal cortex) dominant in neurocognitive adulthood regulates cognitive control, such as reasoning, attention, planning, and memory retrieval. When fully developed after late adolescence, this brain system facilitates a neurological adult's ability to engage in complex decision-making by weighing alternative choices and actions based on future objectives and potential consequences.

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<sup>18</sup> Casey, *Beyond Simple Models of Self-Control to Circuit-Based Accounts of Adolescent Behavior*, 66 *Ann. Rev. of Psych.* 295–319 (2015); see also Cohen, *supra* note 6; Casey et al., *Structural and Functional Brain Development and its Relation to Cognitive Development*, 54 *Biological Psych.* 245–46 (2000).

<sup>19</sup> Galván et al., *Earlier Development of the Accumbens Relative to Orbitofrontal Cortex Might Underlie Risk-Taking Behavior in Adolescents*, 26 *J. Neurosci.* 6885–92 (2006).

<sup>20</sup> Casey et al., *Healthy Development as a Human Right: Insights from Developmental Neuroscience*, 16 *Ann. Rev. Law Soc. Sci.* 203–22 (2020) (hereafter *Healthy Development*); Somerville, *supra* note 11.

Prior to this transition, however, late adolescents remain uniquely vulnerable to impulsive and risky behavior and decision-making because their comparatively developed emotional circuitry prompts outsized receptiveness to short-term rewards and adverse overreaction to threats. For persons in adolescence and late adolescence, dramatic changes are believed to occur in both the prevalence and distribution of the brain's dopamine receptors.<sup>21</sup> These changes favor fleeting rewards and pleasure and correlate with a spike in risk-taking and peer-influenced behaviors. So when faced with acute stress or emotional arousal, late adolescents' supercharged threat and stress response, as well as their eagerness for short-term rewards, are more likely to culminate in poor decision-making, weak impulse control, and limited regard for future consequences. Thus, for late adolescents, the conflicting interactions within and between the more developed limbic system and the relatively less developed prefrontal systems generate a heightened propensity to engage in maladaptive acts including irresponsible or criminal conduct.<sup>22</sup>

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<sup>21</sup> Kinscherff, *supra* note 6, at 2; Braams, *supra* note 11 (measuring changes to dopamine receptors in animals).

<sup>22</sup> See Dreyfuss et al., *Teens Impulsively React rather than Retreat from Threat*, 36 *Dev. Neurosci.* 225-26 (2014); Arain, *Maturation of the Adolescent Brain*, 9 *Neuropsychiatric Disease and Treatment* 453–55 (2013); Tyler, *Understanding the Adolescent Brain and Legal Culpability* (2015) American Bar Association <[https://www.americanbar.org/groups/public\\_interest/child\\_law/resources/child\\_law\\_practiceonline/child\\_law\\_practice/vol-34/august-2015/understanding-the-adolescent-brain-and-legal-culpability/](https://www.americanbar.org/groups/public_interest/child_law/resources/child_law_practiceonline/child_law_practice/vol-34/august-2015/understanding-the-adolescent-brain-and-legal-culpability/)> (accessed January 17, 2022).

As brain imaging research suggests, individuals’ ability to engage in mature decision-making through effective impulse control, risk avoidance, and regulation of emotion and cognition is remains incomplete until after late adolescence.<sup>23</sup> After that point, the brain systems are more evenly developed, such that the systems themselves and the neural pathways linking them can interact to enable suitable regulation of perceived incentives, threats, and consequences. This understanding from modern neuroscience compellingly explains why all late adolescents are especially vulnerable to “recklessness, impulsivity, and heedless risk-taking,” *Miller*, 567 U.S. at 471, and also as to why their proclivity for such behaviors recedes upon reaching neurocognitive adulthood.<sup>24</sup>

**B. Late Adolescents Have Exceptional Capacity for Change Due to their Maturing Brains and Behavioral Growth**

*1. The Brain Has Exceptional Plasticity During Late Adolescence.*

“From a practical and moral standpoint, there is ‘a greater possibility . . . that

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<sup>23</sup> Icenogle et al., *Adolescents’ Cognitive Capacity Reaches Adult Levels Prior to Their Psychosocial Maturity: Evidence for a “Maturity Gap” in a Multinational, Cross-Sectional Sample*, 43 *Law Hum. Behav.* 69–85 (2019); Hawes et al., *Modulation of Reward-Related Neural Activation on Sensation Seeking Across Development*, 146 *NeuroImage* 763–771 (2017) (from the ages of 17 to 25 heightened reward-related reactivity in the brain was linked to increased sensation seeking); Braams, *supra* note 10 (finding neural responses activity in the context of risk-taking does not stabilize until past age 25).

<sup>24</sup> Casey et al., *Making the Sentencing Case: Psychological and Neuroscientific Evidence for Expanding the Age of Youthful Offenders*, 5 *Ann. Rev. of Criminology* 7.1 (2022).

a[n adolescent’s] character deficiencies will be reformed.” *Comer*, 249 N.J. at 395 (quoting *Roper*, 543 U.S. at 570). While the brain has capacity for change (known as “plasticity”) throughout life, it evinces truly remarkable potential for learning and growth during late adolescence.<sup>25</sup> For example, during adolescence, the brain undergoes synaptic pruning, in which unused excitatory synapses (connections between neurons) are eliminated to increase efficiency in communication among the remaining neuronal connections, which supports learning, cognition, and reasoned decision-making.<sup>26</sup> Synaptic pruning, a “hallmark of the brain transformations of adolescence,” continues throughout late adolescence and altogether removes approximately half the synaptic connections in key brain regions, which corresponds with “‘rewiring’ of brain connections into adult-typical patterns.”<sup>27</sup>

Also during this time, brains undergo gradual myelination, in which axons (parts of nerve cells along which nerve impulses are conducted to other cells) are insulated with fatty, insulative tissue known as myelin. Myelination increases the transmission speed of electrical signals, thereby enabling the remaining connected neurons to communicate with greater speed and efficiency between distant regions of the brain. During adolescence and late adolescence, these developing pathways

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<sup>25</sup> See Bavelier et al., *Removing Brakes on Adult Brain Plasticity*, 30 *J. Neurosci.* 14964–71 (2010).

<sup>26</sup> Selemon, *A Role for Synaptic Plasticity in the Adolescent Development of Executive Function*, 3 *Translational Psychiatry* 1 (2013); Casey et al., *supra* note 18.

<sup>27</sup> Spear, *Adolescent Neurodevelopment*, 52 *J. Adolescent Health* 7–13 (2013).

begin to facilitate dialogue among brain systems that process cognitive, emotional, and social information crucial for self-control. These processes prime the brain for change throughout late adolescence, especially in pathways involving the prefrontal cortex supporting decision-making and self-control.<sup>28</sup>

2. *Psychological Capacity Matures with Continued Brain Development Throughout Late Adolescence.*

Strategic behaviors involving planning and decision-making, including under demanding and emotionally arousing conditions, show steady improvements through late adolescence.<sup>29</sup> Late adolescents show diminished capacity in such scenarios, exhibiting heightened sensitivity to rewards, threats,<sup>30</sup> social cues,<sup>31</sup> and

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<sup>28</sup> Forsyth & Lewis, *Mapping the Consequences of Impaired Synaptic Plasticity in Schizophrenia through Development*, 21 *Trends in Cognitive Sci.* 765 (2017).

<sup>29</sup> Steinberg et al., *Age Differences in Future Orientation and Delay Discounting*, 80 *Child Dev.* 28–44 (2009) (concluding that brain “remodeling” affecting planning ahead, temporal orientation, anticipation of future consequences, and delay discounting continues to occur throughout early and late adolescence); Steinberg et al., *Are Adolescents Less Mature than Adults?: Minors’ Access to Abortion, the Juvenile Death Penalty, and the Alleged APA “Flip-Flop,”* 64 *Am. Psych.* 592 (2009) (finding that “in situations that elicit impulsivity” and are “characterized by high levels of emotional arousal,” adolescent decision-making is likely “less mature than adults”); Gardner & Steinberg, *Peer Influence on Risk Taking, Risk Preference, and Risky Decision Making in Adolescence and Adulthood: An Experimental Study*, 41 *Dev. Psych.* 625–35 (2005) (hereafter Gardner & Steinberg) (concluding that adolescents are “more inclined toward risky behavior” in the face of peer influence).

<sup>30</sup> Cohen, *supra* note 6.

<sup>31</sup> See, e.g., Hare et al., *Biological Substrates of Emotional Reactivity and Regulation in Adolescence During an Emotional Go-Nogo Task*, 63 *Biological Psychiatry* 927–34 (2008) (finding that adolescent brains’ weaker top-down regulation of emotional centers, such as the amygdala, affects ability to control

peer influences<sup>32</sup>—combined with an underappreciation for risks, consequences, and self-regulation.<sup>33</sup> This heightened sensitivity can distract individuals and bias decisions in suboptimal ways for late adolescents, such as placing them at a greater risk for criminal activity.<sup>34</sup> Under situations of threat, their cognitive capacity is diminished and does not reach mature levels until the end of late adolescence.<sup>35</sup> Thus, distinguishing the capacity of a 17-year-old and a late adolescent in these charged situations can be functionally impossible.

The wealth of literature on psychological development establishes there is little difference between adolescents and late adolescents regarding cognitive capacity in demanding and emotionally charged situations. Three key findings emerge. First, adolescents and late adolescents show immature psychological abilities relative to neurocognitive adults, which justifies their special treatment and protection. *See Comer*, 249 N.J. at 398-99 (adolescent “transgressions” are

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behavior in highly emotional contexts); Somerville et al., *Frontostriatal Maturation Predicts Cognitive Control Failure to Appetitive Cues in Adolescents*, 23 J. Cognitive Neurosci. 2129 (2011) (concluding that adolescents are “biased to engage in risky behavior at the service of approaching potential rewards”).

<sup>32</sup> *See, e.g.*, Gardner & Steinberg, *supra* note 29.

<sup>33</sup> Beardslee et al., *An Examination of Parental and Peer Influence on Substance Use and Criminal Offending During the Transition from Adolescence to Adulthood*, 45 Crim. Just. Behav. 783–98 (2018); Smith et al., *Peers Increase Adolescent Risk Taking Even When the Probabilities of Negative Outcomes Are Known*, 50 Dev. Psych. 1564–68 (2014).

<sup>34</sup> Beardslee, *supra* note 32; Smith, *supra* note 33; McCord et al., *Co-Offending and Patterns of Juvenile Crime: Research in Brief*, Nat’l Inst. of Just. (2005).

<sup>35</sup> Cohen, *supra* note 6.

less ““morally reprehensible”” given their incomplete development) (quoting *Graham*, 560 U.S. at 68). Second, cognitive, emotional, and social abilities do not develop on the same timeline. Third, these abilities largely coalesce only after late adolescence.<sup>36</sup> As such, late adolescents may make rational decisions in some contexts, such as attending college or voting, but still lack the ability to engage in mature decision-making in highly charged scenarios—especially where peer influences, perceived threats, or short-term incentives are acutely felt.

### **III. *ZUBER* AND *COMER* COMPEL THE CONCLUSION THAT ARTICLE I, PARAGRAPH 12 SHIELDS LATE ADOLESCENTS FROM FUNCTIONAL-LWOP SENTENCES**

“[T]he qualities of [adolescence] matter in everyday life, just as they matter under the Constitution.” *Comer*, 249 N.J. at 394. As the foregoing science made clear, the brains and behaviors of late adolescents develop and change rapidly across all of the constitutionally significant metrics articulated in *Miller*, *Zuber*, and *Comer* much like adolescents under 18—such that the numerical age of 18 is not a rational dividing line for the protections afforded by the N.J. Constitution. Consequently, Article 1, Paragraph 12’s bar on functional-LWOP sentences for adolescents under 18 at the time of their offense, as well as the availability of resentencing after 20 years of incarceration, must apply with equal force to late adolescents.

Indeed, to avoid the “constitutional infirmity” of imposing functional-LWOP

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<sup>36</sup> *Healthy Development*, *supra* note 20.

sentences on late adolescents, this Court need simply hold that *Comer*'s protections extend to late adolescents such that, "under the State Constitution [late adolescents] may petition the court to review their sentence after 20 years." 249 N.J. at 401. In light of the profound brain and behavioral development that occurs during late adolescence, amici respectfully submit that courts sentencing late adolescents to functional-LWOP sentences must have meaningful opportunity "to assess [the late adolescent's] individual circumstances," and later to "review a lengthy sentence at a later date to assess whether the individual has matured." *Id.* at 401.

Recognizing this ongoing infirmity, the Legislature has taken partial steps "to consider youth as a mitigating factor at the time of sentencing" for individuals, including late adolescents, "under 26 years of age at the time of the commission of the offense." N.J.S.A. 2C:44-1(b)(14). However, as it stands, current law leaves intact functional-LWOP for all late adolescents convicted prior to that recent reform. *See State v. Lane*, 251 N.J. 84, 97 (2022). And equally importantly, as this Court stressed in *Comer*, even judicial consideration of *Miller*'s mitigating factors for late adolescents ***solely at the time of sentencing*** still runs headlong into "the very situation this Court highlighted in *Zuber*: the imposition of lengthy sentences with substantial periods of parole ineligibility on [late adolescents], which cannot be reviewed at a later time." *Comer*, 249 N.J. at 401 (citing *Zuber*, 227 N.H. at 451–52). In other words, current law stands in tension the Legislature's recognition that

the mitigating attributes of adolescence extend through age 25. It also effectively disregards the scientific reality that late adolescents mirror adolescents under 18—key ways that the U.S. high court and this Court found constitutionally-significant in *Miller*, *Zuber*, and *Comer*—given their ongoing brain and behavioral development and their profound capacity for maturation and rehabilitation.

As experts in the fields of neuroscience, psychology, and juvenile justice, amici know that it is exceedingly “difficult [] for experts to assess whether a [late adolescent’s] criminal behavior is a sign of transient immaturity or irreparable corruption” such that “courts cannot determine at the outset that a [late adolescent] will never be fit to reenter society.” *Id.* at 395–96. Amici therefore respectfully submit that, just as *Comer* held for adolescents under the age of 18, late adolescents aged 18-20 too “must be given a chance to show they are fit to reenter society” after a twenty-year period of incarceration. *Id.*

### **CONCLUSION**

For the foregoing reasons, this Court should grant the petition for certification and reevaluate whether courts may irrevocably condemn late adolescents still undergoing transformational brain and behavioral development to functional-LWOP sentences in violation of Article I, Paragraph 12.

Dated: July 12, 2024

Respectfully submitted,

/s/ Evan Lazerowitz  
Adam S. Gershenson

Matt K. Nguyen  
Matthew Oliver  
Evan Lazerowitz

*Counsel for Amici Curiae Neuroscience,  
Psychology, and Juvenile Justice Scholars*

**APPENDIX: NEUROSCIENCE, PSYCHOLOGY, AND JUVENILE JUSTICE SCHOLAR AMICI CURIAE<sup>37</sup>**

**Dr. Jeffrey Aaron** is a clinical and forensic psychologist who practices independently and teaches in the University of Virginia Medical School. Much of his work focuses on forensic evaluation of adolescents and the influence of adolescents' developmental status on their behavior, capacities, risk, and intervention needs.

**Dr. Apryl Alexander** is the Metrolina Distinguished Scholar in Health & Public Policy and Associate Professor in the Department of Public Health Sciences at the University of North Carolina at Charlotte. Her research focuses on violence, trauma, and clinical treatment of justice-involved adolescents.

**Dr. Jeffrey Arnett** is a Senior Research Scholar at Clark University. He has been researching and conceptualizing the age period from 18 to 25, that he termed emerging adulthood, for the past 30 years. He is the originator of the theory of emerging adulthood (human development from age 18-29) and has written many articles and books on this topic. In addition to emerging adulthood, his other scholarly interests include media uses in adolescence, the psychology of globalization, and responses to cigarette advertising.

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<sup>37</sup> Amici have signed this Brief solely in their personal capacities and not on behalf of their affiliated institutions. Titles and institutional affiliations are solely for identification purposes.

**Dr. Arielle Baskin-Sommers** is an Associate Professor of Psychology and Psychiatry at Yale University. Her work focuses on identifying and specifying the cognitive, emotional, and environmental mechanisms that contribute to antisocial behavior (e.g., substance use, criminal activity, aggression). She uses findings from her research to develop novel experimental tasks, assessments, and intervention strategies aimed at developing more humane (and scientific) approaches for addressing mental health and crime.

**Dr. Sara Boyd** is a licensed clinical psychologist, board-certified forensic psychologist, and associate faculty at the Forensic Clinic of the Institute of Law, Psychiatry, & Public Policy (ILPPP) at the University of Virginia. Her primary specialties include Intellectual and Developmental Disabilities and psychological trauma (particularly interpersonal violence) in children and adults. She also develops and conducts trainings for forensic evaluators, mental health care providers and legal professionals, provided under the auspices of ILPPP.

**Dr. B.J. Casey** is the Christina L. Williams Professor of Neuroscience in the Department of Neuroscience and Behavior at Barnard College, Columbia University and member of The Justice Collaboratory of Yale Law School. She pioneered the use of fMRI to examine the developing human brain, particularly during adolescence, accelerating the emergence of the field of developmental cognitive neuroscience. Her scientific discoveries have been published in over 250 articles in

top journals including *Nature Medicine*, *Nature Neuroscience*, *Neuron*, *PNAS*, and *Science*, cited over 74,000 times, and highlighted by NPR, PBS, NY Times, and National Geographic. She has received numerous honors including the Association for Psychological Science Lifetime Achievement Mentor Award, the American Psychological Association Distinguished Scientific Contribution Award, and is an elected member of the American Academy of Arts and Science.

**Dr. Hayley Cleary** is an Associate Professor of Criminal Justice and Public Policy at Virginia Commonwealth University. She holds a Master of Public Policy and Ph.D. in Developmental Psychology from Georgetown University. Her research lies at the intersection of social science, law, and policy. Her work, funded by the National Science Foundation and Annie E. Casey Foundation, examines adolescent behavior and decision-making in legal contexts, including adolescents' contact with law enforcement, courts, and correctional systems.

**Dr. Alexandra Cohen** is an Assistant Professor of Psychology and Core Faculty in Neuroscience and Behavioral Biology at Emory University. Her research focuses on understanding the neural and cognitive mechanisms underlying how emotion and motivation influence learning, memory, and brain function from childhood to adulthood. She has received funding from the American Psychological Association, the National Science Foundation, and the National Institutes of Health to support her work.

**Laura Cohen** is a Professor of Law and the Justice Virginia Long Scholar at Rutgers Law School, where she founded and directs the Center for Criminal Justice, Youth Rights, and Race; the Criminal and Youth Justice Clinic; and the New Jersey Innocence Project at Rutgers University. Her legal scholarship and policy work focus on the intersection of developmental science and adolescent justice policy and practice, particularly with regard to sentencing and parole. She has appeared before this Court as or on behalf of amicus curiae in numerous matters, including *State v. Comer* / *State v. Zarate*, 249 N.J. 359 (2022).

**Dr. Tarika Daftary-Kapur** is an Associate Professor of Justice Studies at Montclair State University. Her research lies primarily in adolescent decision-making and legal competencies presently focused on plea deal decision making, and jury decision making. Dr. Daftary-Kapur is currently working on a multi-year project examining reentry experiences of adolescents sentenced to life without parole and subsequently released.

**Dr. Judith Edersheim** is the founding co-director of the Massachusetts General Hospital Center for Law, Brain and Behavior, where she is an attending psychiatrist, as well as an Assistant Professor of Psychiatry at Harvard Medical School. Dr. Edersheim's work at the Center focuses on bringing insights from neuroscience, neurology, and psychiatry into the legal arena in an effort to improve the justice system, and she lectures extensively in state and federal court settings and

the teaching programs of Massachusetts General Hospital, Harvard Medical School, and Harvard Law School.

**Dr. Jeffrey Fagan** is the Isidor and Seville Sulzbacher Professor of Law and Professor of Epidemiology at Columbia University. His scholarship focuses on fairness and equity in the administration of justice. His research examines race and criminal law, capital punishment, policing and police reform, firearm violence and regulation, and adolescent crime and punishment.

**Dr. Adriana Galván** is a Professor of Psychology and the Dean of Undergraduate Education at the University of California, Los Angeles. She is also Co-Executive Director of the UCLA Center for the Developing Adolescent. Her scholarship focuses on the adolescent brain and behavior, with a focus on motivation, learning, and risk-taking and with an eye towards informing adolescent-relevant policy. She has received multiple awards, including from the Cognitive Neuroscience Society, American Psychological Association, William T. Grant Foundation, National Academy of Sciences, a Fulbright Award, and the Presidential Early Career Award for Scientists and Engineers.

**Dr. Jay N. Giedd** is chair of the division of child and adolescent psychiatry at the University of California, San Diego, and a professor at the Johns Hopkins Bloomberg School of Public Health. Since 1991, he has researched the biological basis of cognition, emotion, and behavior with a particular emphasis on adolescent

brain maturation and decision-making, and the education science/neuroscience interface. His research has been cited over 100,000 times. Dr. Giedd was previously chief of the section on brain imaging in the Child Psychiatry Branch of the National Institutes of Health and editor-in-chief of *Mind, Brain, and Education*.

**Dr. Catherine Hartley** is an Associate Professor of Psychology and Neural Science and is Co-Director of the Institute for the Study of Decision Making at New York University. Her scholarly work focuses on understanding developmental changes in learning and decision-making from childhood to adulthood at both the cognitive and neural levels, with a focus on understanding mechanisms of vulnerability or resilience to psychopathology. She has received multiple awards for her work, including a National Science Foundation CAREER Award, the National Institute of Mental Health Biobehavioral Research Award for Innovative New Scientists, the Association for Psychological Science Janet Taylor Spence Award for Transformative Early Career Contributions, and the Cognitive Neuroscience Society Young Investigator Award.

**Dr. Luke Hyde** is a Professor of Psychology and Chair of the Clinical Psychology Area of Psychology with appointments at the Institute for Social Research and the Poverty Solutions Center at the University of Michigan. He is a licensed clinical psychologist in the State of Michigan. He is an expert in neuroscience and the development of aggression, violence, and criminal behavior.

His research focuses on the development of high-risk behavior, the interplay of nature and nurture, and factors that promote resilience and desistance from delinquent behavior.

**Dr. Catherine Insel** is a postdoctoral research scientist at the Zuckerman Mind Brain and Behavior Institute at Columbia University. She received her Ph.D. from Harvard University and is an expert on adolescent brain development. Her research, funded by the National Science Foundation and National Institutes of Health, examines the neurocognitive development of motivation, learning, memory, and cognitive control.

**Dr. Daniel Keating** is a Professor of Psychology, Psychiatry, and Pediatrics at the University of Michigan. His research and publications (over 200) have focused on adolescent development and neurodevelopment, with a recent specific focus on the role of brain development on risk behavior, funded by the National Institutes of Health. His book on the impact of early life adversity on later development, *Born Anxious* (2017) received the annual award in developmental psychology from the American Psychological Association.

**Dr. Robert Kinscherff** is a clinical, forensic psychologist and attorney serving as Executive Director of the Center for Law, Brain & Behavior at Massachusetts General Hospital. Over a career of more than three decades, he has filled key forensic positions for the Massachusetts Trial Court, Massachusetts

Department of Mental Health, Massachusetts Parole Board, and clinical and forensic mental health systems. He teaches and consults nationally and internationally in practice areas including juvenile and criminal justice, violent and sexual offenders, and professional practice and policy at the nexus of neuroscience, developmental psychology, adversity and trauma, and addictions.

**Dr. Robert J. McCaffrey** is an emeritus professor of psychology at the University at Albany. Dr. McCaffrey is a board-certified clinical neuropsychologist with specializations across the life-span. Dr. McCaffrey is past President of the National Academy of Neuropsychology, the American Board of Professional Neuropsychology, the Past President of the American Academy of Pediatric Neuropsychology. He is a fellow of the National Academy of Neuropsychology, the American Psychological Association, the Association of Psychological Science, the American College of Professional Neuropsychology, and the American Academy of Pediatric Neuropsychology. Dr. McCaffrey was Editor-in-Chief of *Archives of Clinical Neuropsychology*, the official journal of the National Academy of Neuropsychology, and is Editor-in-Chief of *Developmental Neuropsychology: An International Journal of Life-Span Issues in Neuropsychology*.

**Tracey Meares** is the Walton Hale Hamilton Professor and a Founding Director of the Justice Collaboratory at Yale Law School that brings together an interdisciplinary group of scholars and researchers at Yale and beyond to

cooperatively work toward a theory-driven, evidence-informed justice system. She has worked extensively with the federal government by serving on the National Academy of Sciences Committee on Law and Justice, a National Research Council standing committee, and the U.S. Department of Justice's Office of Justice Programs Science Advisory Board.

**Dr. Grace Mucci** is an Associate Clinical (Volunteer) Professor in the Department of Pediatrics at the University of California, Irvine, and licensed clinical psychologist and pediatric neuropsychologist currently practicing in hospital and private practice settings. Board-certified in Pediatric Neuropsychology through the American Board of Pediatric Neuropsychology, she also serves as the Executive Director of the American Academy of Pediatric Neuropsychology.

**Dr. Ashley Nellis** is a life imprisonment scholar and Co-Director of Research at The Sentencing Project. Her research documents the prevalence of life sentences in America. Her research has been used to inform policies and practices of imposing life sentences on various segments of society including: adolescents, late adolescents, victims of domestic violence, and the elderly.

**Dr. Cecil Reynolds** is Editor-in-Chief of the peer-reviewed *Journal of Pediatric Neuropsychology*, Emeritus Professor of Neuroscience and Educational Psychology and distinguished research scholar at Texas A&M University, and a clinical neuropsychologist who also had a clinical practice for more than 25 years

treating children, adolescents, and late adolescents. He is in the top quarter of the Stanford list of the top 2% of scientists worldwide and the *Oxford Handbook of the History of Clinical Neuropsychology* ranks him as the 7th most influential person in the history of the field based on the impact of his published works.

**Dr. Joseph Ryan** is Professor and Associate Dean in the School of Social Work at the University of Michigan. He is also the Director of the Child and Adolescent Data Lab, an applied research center focused on using data to drive policy and practice decisions. His research and teaching build on his direct practice experiences with child welfare and juvenile justice populations.

**Dr. Elizabeth Shulman** is an associate professor of psychology at Brock University and a developmental psychologist with a focus on psychosocial development across adolescence. She earned her Ph.D. from the University of California, Irvine. Her research focuses on developmental factors that affect risky decision making in adolescence and late adolescence.

**Dr. Jennifer Silvers** is the Bernice Wenzel and Wendell Jeffrey Term Chair in Developmental Neuroscience at the University of California, Los Angeles. She has published over 60 articles on the brain and behavioral bases of emotion, decision-making, and adolescent development. Dr. Silvers has received funding from the National Science Foundation and National Institutes of Health, as well as awards from the American Psychological Association, Association for

Psychological Science, and the International Society for Developmental Psychobiology.

**Dr. Leah Somerville** is the Grafstein Family Professor of Psychology at Harvard University and faculty in the Center for Brain Science. Her research focuses on characterizing adolescent brain development, and the consequences of brain development on psychological functioning and well-being. This work integrates behavioral, computational, and brain imaging approaches, including the Human Connectome Project in Development, a large NIH-funded study on brain connectivity development.

**Dr. Elizabeth Sowell** is a Professor of Pediatrics at the Keck School of Medicine at the University of Southern California. She has been a leader in developmental cognitive neuroimaging for over 20 years and has published over 150 peer review manuscripts in leading journals, including *Nature Neuroscience*, *Nature Medicine*, and the *Lancet*, among others. Her research focuses on adolescent brain and cognitive development as well as the impact of pre- and post-natal exposures to drugs of abuse, environmental toxins (i.e., lead exposure), and family and neighborhood level socioeconomic adversity. Dr. Sowell has been continuously funded by the National Institutes of Health for over 20 years, and she is currently a principal investigator in the Adolescent Brain Cognitive Development study at Children's Hospital Los Angeles.

**Dr. Laurence Steinberg** is a Distinguished University Professor and the Laura H. Carnell Professor of Psychology and Neuroscience at Temple University. He is a Fellow of the American Academy of Arts and Sciences and was the lead scientist for the American Psychological Association on its U.S. Supreme Court amicus briefs in *Roper v. Simmons*, *Graham v. Florida*, and *Miller v. Alabama*. With Elizabeth Scott, he is co-author of *Rethinking Juvenile Justice*.

**Dr. Jennifer Woolard** is a professor of psychology and Vice Dean for Faculty Affairs in the College of Arts & Sciences at Georgetown University. Her research and action laboratory, the Georgetown Community Research Group, studies individual and family experiences with systems of care and control in order to create fair, effective, and just legal processes. Dr. Woolard testifies as an expert in adolescent and criminal cases and has presented her research findings to a wide variety of academic, legal, and policy audiences.

**Dr. Tina Zottoli** is an Associate Professor of Psychology and Director of the Legal Decision Making Lab at Montclair State University. She holds a Ph.D. in Psychology from the City University of New York, John Jay College of Criminal Justice and is a licensed clinical psychologist in the state of New York. Her scholarship centers on decision making in legal contexts, with a focus on outcomes for system-involved adolescents, including late adolescents. Her work on recidivism risk in persons released from life sentences for crimes committed during adolescence

has garnered national attention, and she has testified before the legislatures of several states with respect to proposed second-chance legislation for adolescents.

EVAN MARC LAZEROWITZ, Esq.  
COOLEY, LLP  
55 HUDSON YARDS  
NEW YORK, NY, 10001-2163  
212-479-6000  
ELAZEROWITZ@COOLEY.COM  
CALENDARDEPARTMENT@COOLEY.COM  
Attorney Bar ID: 063232013

SUPREME COURT OF NEW JERSEY  
APP. DIV. # A-001358-22  
SUPREME COURT # 089524

CRIMINAL ACTION

State of New Jersey,  
  
Plaintiff,

v.

Sean Jones,  
  
Defendant.

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State of New Jersey,  
  
Plaintiff,

v.

CERTIFICATION OF SERVICE

Richard Roche,  
  
Defendant.

-----  
State of New Jersey,  
  
Plaintiff-Respondent,

v.

Timothy Harris,  
  
Defendant-Petitioner.

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I hereby certify that the following documents, MOTION FOR LEAVE TO APPEAR AMICUS CURIAE, BRIEF IN SUPPORT OF MOTION were submitted and transmitted to the parties listed below in the following format:

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ATTORNEY NAME: ALEXANDER R SHALOM, Esq.  
ASHALOM@LOWENSTEIN.COM  
DPANZER@LOWENSTEIN.COM

ATTORNEY NAME: ETHAN J KISCH, Esq.  
ETHAN.KISCH@OPD.NJ.GOV  
PD.APPELLATE@OPD.NJ.GOV

ATTORNEY NAME: FRANK J DUCOAT , Esq.  
APPELLATE@NJECPO.ORG  
FRANK.DUCOAT@NJECPO.ORG  
FRANKDUCOAT@YAHOO.COM

ATTORNEY NAME: HANNAH FAYE KURT , Esq.  
APPELLATE@NJECPO.ORG  
HANNAH.KURT@NJECPO.ORG

ATTORNEY NAME: LUCILLE M ROSANO , Esq.  
APPELLATE@NJECPO.ORG  
LUCILLE.ROSANO@NJECPO.ORG

ATTORNEY NAME: MICHAEL TIMOTHY DENNY , Esq.  
MICHAEL.DENNY@OPD.NJ.GOV  
PD.APPELLATE@OPD.NJ.GOV

ATTORNEY NAME: PETER THOMAS BLUM , Esq.  
PD.APPELLATE@OPD.NJ.GOV  
PETER.BLUM@OPD.NJ.GOV

ATTORNEY NAME: STEVEN A YOMTOV , Esq.  
DCJ-EFILE@NJDCJ.ORG  
YOMTOVS@NJDCJ.ORG

BY MAIL:

I certify that the foregoing statements made by me are true. I am aware that if any of the foregoing statements made by me are willfully false, I am subject to punishment.

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Attorney for Filing Party  
NEUROSCIENCE, PSYCHOLOGY, AND JUVENILE  
JUSTICE SCH

S/ EVAN MARC LAZEROWITZ, Esq.

Dated: 07/12/2024